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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/808,813	03/15/2001	Toshiaki Shimada	OCW-003	6330

959 7590 07/16/2003

LAHIVE & COCKFIELD  
28 STATE STREET  
BOSTON, MA 02109

EXAMINER

LEUNG, JENNIFER A

ART UNIT	PAPER NUMBER
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1764

8

DATE MAILED: 07/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/808,813

Applicant(s)

SHIMADA, TOSHIKI

Examiner

Jennifer A. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 9-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Response to Amendment*

1. Applicants Amendment submitted on April 24, 2003 has been received and carefully considered. The changes made to the Specification are acceptable. Claims 1-8 have been cancelled. Claims 9-17 have been added and remain active.

### *Claim Rejections - 35 USC § 103*

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 9-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imoto et al. (JP 08-094610) in view of Sato et al. (JP 10-245202).

Regarding claims 9, 12 and 13, Imoto et al. (FIG. 1, Abstract, machine translation) disclose a hydrogen occlusion alloy regenerating apparatus, as well as the corresponding method of regenerating the apparatus, wherein the apparatus comprises:

- A deterioration detecting means (mass-flow meter 4) for sending a detection signal (i.e., to control unit 6) when a hydrogen occlusion alloy 1 or 2 in a hydrogen reservoir has been deteriorated due to deposition of impurities; and
- A heating means (heater 8 or 9; section [0012], [0014]-[0015]) for heating the alloy 1 or 2 based on the detection signal from the deterioration detecting means 4.

According to the specification, page 13 lines 7-10, “the fourth flow meter 52 has a function as a deterioration detection means,” and according to page 15 lines 8-10, “heating circuit 56 associated with the second storage section 51 is used also as the heating means.” Thus, flow meter 4 and heaters 8, 9 (operated by power circuit 7) of Imoto et al. meet the claim.

In view of the newly added limitations, Imoto et al. are silent as to whether the apparatus may further comprise a remaining-amount detecting means that sends a detection signal when an internal pressure of the hydrogen reservoir is not more than an upper limit pressure used in the hydrogen reservoir.

Sato et al. (FIG. 1, Abstract, machine translation sections [0009] - [0022]) teach a hydrogen occlusion alloy regenerating apparatus, as well as the corresponding method of regenerating the apparatus, wherein the apparatus comprises a vessel 4 containing a hydrogen occlusion alloy M and a remaining-amount detecting means (i.e., pressure detection means, or pressure gage 7) for detecting a remaining amount of hydrogen occluded in alloy M and sending a detection signal to a control means (to operate the sequence of operations indicated in Table 1, section [0018]) when the internal pressure caused by the release of hydrogen is not more than an upper limit pressure of the vessel, (i.e., when the pressure declines from an "upper limit of a set pressure" during a "discharge operation" to a "minimum of a set pressure"). It would have been obvious for one of ordinary skill in the art at the time the invention was made to provide a remaining-amount detecting means to the apparatus of Imoto et al. because such would provide additional control of the regenerating apparatus by determining and setting the end point of the regenerating or "discharge operation" (i.e., upon the detection of the "minimum of a set pressure"), thereby re-initiating the hydrogen occlusion or "absorption operation" and creating a continuous regeneration and occlusion process, as taught by Sato et al.

Regarding claims 10 and 14, Imoto et al. further disclose said deterioration detecting means 4 detects an amount of hydrogen occluded in said hydrogen-occlusion alloy 1 or 2 (i.e. "the effective amount of hydrogen movement"; Abstract), and sends the detection signal (via

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control unit 6) if the amount of hydrogen occluded is smaller than an amount of hydrogen occluded when the hydrogen occlusion alloy is normal.

Regarding claims 11 and 15, although the collective teachings of Imoto et al. and Sato et al. are silent as to specifically a "rate of occlusion", it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the rate of occlusion by merely dividing "the effective amount of hydrogen movement", as detected by the deterioration detecting means 4 above, by the operating time.

3. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imoto et al. (JP 08-094610) in view of Sato et al. (JP 10-245202), and further in view of Gamo et al. (U.S. 5,976,725).

The same comments with respect to Imoto et al. and Sato et al. apply (see comments regarding claims 9, 12 and 13 above). Sato et al. further teach the incorporation of a hydrogen occlusion alloy regenerating apparatus with a hydrogen use equipment 1 (FIG. 1; section [0007]). However, the collective teachings of Imoto et al. and Sato et al. are silent as to whether the hydrogen released from alloy may be utilized for operating a fuel cell system. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to utilize the modified hydrogen occlusion alloy regenerating apparatus and method of Imoto et al. for supplying hydrogen to a fuel cell system, since the incorporation of such devices with fuel cell power generation systems is conventionally known in the art, as evidenced by Gamo et al. (column 1, lines 22-26). Gamo et al. further teach that the use of hydrogen occlusion alloys provides a portable and safe means of supplying fuel to a fuel cell system since operating pressure can be kept low (column 11, lines 26-28).

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***Response to Arguments***

4. Applicant's arguments with respect to claims 9-17 have been considered but are moot in view of the new grounds of rejection, as necessitated by amendment.

***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

\* \* \*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is 703-305-4951. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on 703-308-6824. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jennifer A. Leung

July 12, 2003 

  
**HIEN TRAN**  
**PRIMARY EXAMINER**